Flora of the Malayan Peninsula," by Dr. George King, F.R.S. The publication of these very valuable contributions to botanical science was commenced more than seven years ago, but pressure of other work has prevented Dr. King from making as rapid progress as he desired. In the present part the account of the Calycifloræ is begun, and it is hoped that one more contribution similar in size to that just published will suffice to complete the Calycifloræ, and bring the whole series about half-way towards completion.

DURING the Norwegian North-Atlantic Expedition (1876-78), Prof. G. O. Sars collected from the surface a quantity of plankton containing many algæ, especially Diatoms. He described the most characteristic forms, and early last year handed over the samples for more detailed study to H. H. Gran, whose description of the material has now been published in Memoir xxiv. of the "General Report of the Norwegian North-Atlantic Expedition" (Christiania: Grondahl and Sons), printed in both Norse and English. The study of the material shows that the water of the Atlantic is especially characterised by *Chætoceros decipiens*, *atlanticum*, *boreale* and *Brightwellii*, and by several *Rhizosolenia* species. The water of the Polar Sea during summer is characterised by *Chætoceros furcellatum*, *Fragilaria oceanica*, and *Thallassiosira* species. From the contents of the samples, however, no decided boundary could be drawn, either because the ocean currents mix to a certain extent with one another, or because the Diatomaceæ have the power of rising or sinking from one stratum of water to another, independently of the currents. Mr. Gran states that he has obtained evidence which clearly points to the occurrence of the latter possibility.

THE following are among noteworthy papers and other publications which have been received during the past few days:—The letters exchanged between the two mathematicians Jakob Steiner and Ludwig Schläffi from the year 1848 to 1856 are printed in the *Mittheilungen der Naturforschenden Gesellschaft in Bern* (1896), edited by Prof. J. H. Graf.—Mr. Bernard Quaritch has just issued two catalogues (Nos. 170, 172) of scientific books, and Transactions of learned societies, offered for sale by him. We notice in the list a set of *Challenger* Expedition Reports for sale for 67*l.* 10*s.* Scientific book-buyers and librarians should certainly see Mr. Quaritch's catalogues.—Part v. of "Fresenius' Quantitative Analysis" (vol ii.), translated by Mr. Chas. E. Groves, F.R.S., has just been published by Messrs. J. and A. Churchill.

THE additions to the Zoological Society's Gardens during the past week include a Huanaco (*Lama huanacos*, ♀) from Bolivia, presented by Mr. W. J. Huxley; a —— Mouse (*Phyllotis griseoflavus*), two Chimachima Milvagos (*Milvago chimachima*), three Pileated Song Sparrows (*Zonotrichia pileata*), three Yellowish Finches (*Sycalis luteola*), two Bay Cow Birds (*Molothrus bodius*), a Yellow Troupial (*Xanthosomus flavus*) from Argentina, three West African Love Birds (*Agapornis pullaria*) from West Africa, presented by Mr. E. A. Fitzgerald; a Malabar Squirrel (*Sciurus maximus*) from India, presented by Mr. J. E. Summers; two Rough-legged Buzzards (*Archibuteo lagopus*), European, presented by Mr. H. W. Feilden; a European Tortoise (*Emys orbicularis*) European, presented by Mr. Duncan Dickens; eleven Green Lizards (*Lacerta viridis*), two Sand Lizards (*Lacerta agilis*), a Wall Lizard (*Lacerta muralis*), European, presented by Mr. C. W. Tytheridge; a Crested Porcupine (*Hystrix cristata*), three White Storks (*Ciconia alba*), a Greater Black-backed Gull (*Larus marinus*), a Herring Gull (*Larus argentatus*), a Common Night Heron (*Nycticorax griseus*), two Buzzards (*Buteo vulgaris*), European, two Ypecaha Rails (*Aramides ypecaha*) from South America, deposited; a Barbary Wild Sheep (*Ovis tragelaphus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

DEDICATION OF THE YERKES OBSERVATORY.—The formal dedication of the Yerkes Observatory will take place on October 21–22, and not on October 1, as previously announced. In connection with the dedication, a series of conferences on astronomical and astrophysical subjects will be held at the observatory on October 18, 19, 20, and 21. The provisional programme for these meetings is published in the August number of the *Astrophysical Journal.*

SOUTHERN DOUBLE STARS.—Profs. W. H. Pickering and S. I. Bailey have taken advantage of the steady air of Arequipa, and the consequent good definition, to search for close double stars in the southern skies. All the stars of the sixth magnitude and brighter, south of declination −30°, have been examined for close companions, with the 13-inch Boyden telescope. Nearly one hundred and fifty stars were thus found to have companions at distances not exceeding thirty seconds of arc, not counting stars already announced as double in the catalogues of Herschel and Russell. The numbers of these stars in the Argentine General Catalogue are recorded in *Harvard College Observatory Circular*, No. 18.

VARIABLE STARS IN CLUSTERS.—The important fact that a large number of individual stars in certain globular star clusters are variable, sometimes to the extent of two magnitudes or more, was announced in *Harvard College Observatory Circular* (No. 2) in November 1895 (see NATURE, vol. liii. p. 91), and was again referred to in May 1896 (NATURE, vol. liv. p. 108). A *Circular* (No. 18) just received from the observatory, announces that Prof. S. I. Bailey has found many more of these, bringing their total number up to 310. The greatest number of variables occur in the cluster No. 5272 in the New General Catalogue (Messier 3), as many as 113 stars in this cluster having been found to fluctuate in light. In N.G.C. 5904 (Messier 5), 63 stars have been proved to be variable, and in N.G.C. 5139 (ω Centauri) 60 stars appear to undergo light-changes. It is remarkable that while in the cluster Messier 3 about one-ninth of the stars are variable, in other clusters, for instance the great cluster in Hercules (N.G.C. 6205), not a single variable was found out of nearly two thousand stars examined.

THE MAGNITUDES OF THE ASTEROIDS.—An interesting history of the asteroids and the questions to which they give rise, is given by Herr G. Huber in the *Mittheilungen der Naturforschenden Gesellschaft in Bern* for the year 1896. The mean magnitude at opposition of the first four hundred minor planets are tabulated in groups of fifty as follows, the column marked Mag. 8 including asteroids of magnitudes 8 to 8·9, while the column marked Mag. 9 includes all from magnitude 9 to mag. 9·9, and so on for other magnitudes.

Numbers of asteroids.	Brighter than Mag. 8	Mag. 8	Mag. 9	Mag. 10	Mag. 11	Mag. 12	Fainter than Mag. 12
1–50	2	7	17	15	7	2	—
51–100	—	—	2	19	23	5	1
101–150	—	—	—	15	27	8	—
151–200	—	—	1	4	20	20	5
201–250	—	—	—	3	18	17	12
251–300	—	—	—	1	7	13	29
301–350	—	—	2	2	8	21	17
351–400	—	—	—	2	4	13	31
Total ...	2	7	22	61	114	99	95

The table shows clearly that the asteroids discovered in recent years, namely those from No. 200 to No. 400, are mainly of the twelfth magnitude, or even fainter than that.

A NEW NEBULA PHOTOGRAPH.—A brilliant picture of the nebula Herschel V 15 Cygni (No. 6992 in the New General Catalogue), reproduced from a photograph obtained by Dr. Isaac Roberts, F.R.S., with an exposure of 2h. 55m., appears in the September number of *Knowledge*. The nebula is a wave-like brush of light, measuring about eighty minutes of arc in length,

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and presenting a torn appearance in places. Faint nebulous stars are immersed in the wave structure, and here and there the luminous material gives indications of condensation. Surrounding the nebula, and strewn over its surface are numerous stars, which are, however, apparently not physically connected with the general mass. Referring to the structure of the nebula in relation to the methods of stellar evolution, Dr. Roberts says:—"The general appearance of the nebula is that of precipitation of invisible matter—either gaseous or of dust particles —which exists in space as clouds of vast extent. . . . We know of no body whatever existing in space which has no motion of translation; but whether this invisible matter is in motion or at rest, it could be run into by another body that is in motion, with the result that whirlpool motions would be set up that would eventually develop into nebulæ of various forms, such as those which have already been, by photography, shown to exist. If, on the other hand, the clouds themselves are in motion and collide with each other, then vortical motion would be set up over large areas, giving rise by progress of development to such nebulæ as are represented by the photograph. This nebula shows signs of fission, and may pass in its process of development into symmetrical nebulæ and into stars, and again from stars into—what?"

A SUCCESSFUL EXPERIMENT IN LOBSTER-REARING.

ATTEMPTS to rear the larvæ of the lobster in this country have never hitherto succeeded. Several years ago Captain Dannevig reared some at Arendal, and published a description of his results, but no other instance of success with the European species has been recorded. In America the rearing of the American species has been successfully accomplished at Wood's Hole by Mr. F. H. Herrick, and a masterly description of the stages of the development, with extremely fine illustrations, was recently published by him as a number of the Fish Commission Bülletin. At the establishment of the Marine Biological Association at Plymouth attempts to rear lobster larvæ have been made, but never with success. In the tanks the larvæ invariably died after a few days, and when the hulk of a superannuated fishing-vessel was fitted up, provided with a well to which the water could have access, and moored in the Sound, she unfortunately sank at her moorings with the thousands of larvæ which she contained. It is therefore a fact not without interest and importance, that the difficult feat has been accomplished with some success during the present season at Falmouth. During the last two or three years, experiments in oyster and lobster culture have been carried on at that place under the auspices of a committee of the Royal Cornwall Polytechnic Society, the cost of the work being defrayed from a fund collected by private subscription, supplemented by grants from the Technical Instruction Committee. Until the commencement of this year the experiments were directed by Mr. Rupert Vallentin, who designed a large floating box 14 feet by 6 feet in area, by 3 feet in depth, provided with windows covered with metal gratings, for the purpose of rearing lobster larvæ. This box is moored in a corner of the docks where the water seemed quite pure. Last year no success was obtained, owing to an injury to the box. During the present season the experiments have been under the direction of Mr. J. T. Cunningham, the Lecturer on Fisheries for the county. Berried female lobsters were first placed in the box on and about June 24, to the number of three. Larvæ were first seen on July 6, and were fed on minced fish, but the number rapidly diminished. Seven more berried females were put in on July 16, and since that time there has always been a considerable number of larvæ alive in the box; some of the females have not yet hatched all their eggs (August 22). Since July 16 the only food supplied has been the crushed and pounded flesh of the edible crab, the females of which could be obtained regularly at small cost. It was found essential to feed the larvæ every day. As usual there was considerable mortality, and the larvæ showed their inveterate tendency to cannibalism; but a few specimens have passed through the various stages of their metamorphosis. Students of Herrick's memoir are aware that the final condition is reached, not considering certain minor features of little importance, at the fourth stage. The first stage is characterised by the entire absence of abdominal appendages, and the presence of the thoracic exopodites. After the second moult four pairs of abdominal pleopods are developed, at the third the uropods on the sixth abdominal somite are added, and at the fourth moult the exopodites are lost, and the antennary flagella appear. A specimen in the third stage was taken from the hatching-box at Falmouth on August 12, and one in the fourth stage on August 22.

The rearing of lobster larvæ may always remain too difficult and too expensive to be of any practical importance, and the survival of a single specimen may appear to be a small success. But there is every probability that other specimens will reach the same or later stages in the course of the experiment, and, considering the large amount of attention that the problem has attracted, the result above described is worthy of record.

THE BRITISH ASSOCIATION.

SECTION K.

BOTANY.

OPENING ADDRESS BY PROF. H. MARSHALL WARD, SC.D., F.R.S., F.L.S., PRESIDENT OF THE SECTION.

THE competent historian of our branch of science will have no lack of materials when he comes to review the progress of botany during the latter half of the Victorian reign. The task of doing justice to the work in phanerogamic botany alone, under the leadership of men like Hooker, Asa Gray, Mueller, Engler, Warming, and the army of systematists so busily shifting the frontiers of the various natural groups of flowering plants, will need able hands for satisfactory treatment. A mere sketch of the influence of Kew, the principal centre of systematic botany, and of the active contingents of Indian and colonial botanists working under its inspiration, will alone require an important chapter, and it will need full knowledge and a wide vision to avoid inadequacy of treatment of its powerful stimulus on all departments of post-Darwinian botany. The "Genera Plantarum," the "British Flora," the "Flora of India," suffice to remind us of the prestige of England in systematic botany, and the influence of the large and growing library of local and colonial floras we owe to the labours of Bentham, Trimen, Clarke, Oliver, Baker, Hemsley, Brandis, King, Gamble, Balfour, and the present Director of Kew, is more than merely imperial.

The progress in Europe and America of the other departments of botany has been no less remarkable, and indeed histology and anatomy, comparative morphology, and the physiology and pathology of plants have perhaps advanced even more rapidly, because the ground was newer. In England the work done at Cambridge, South Kensington and elsewhere, and the publications in the "Annals of Botany" and other journals sufficiently bear witness to this. A consequence has been the specialisation which must soon be openly recognised—as it already is tacitly—in botany as in zoological and other branches of science.

No note has been more clearly sounded than this during the past twenty-five years, as is evident to all who have seen the origin, rise, and progress of our modern laboratories, special journals, and even the gradual subdivisions of this Association. We may deplore this, as some deplore the departure of the days when a naturalist was expected to teach geology, zoology, and botany as a matter of course; but the inevitable must come. Already the establishment of bacteriological laboratories and a huge special literature, of zymo-technical laboratories and courses on the study of yeasts and mould fungi, of agricultural stations, forestry and dairy schools, and so on—all these are signs of the inexorable results of progress.

There are disadvantages, as the various *Centralblätter* and special journals show; for hurried work and feverish contentions for priority are apt to accompany these subdivisions of labour; and those of us who are most intimately concerned with the teaching of botany will do well to take heed of these signs of our times, and distinguish between the healthy specialisation inevitably due to the sheer weight and magnitude of our subject, and that incident on other movements and arising from other causes. The teaching and training in a university or school need not be narrow because its research-laboratories are famous for special work.

One powerful cause of modern specialisation is utility. The development of industries like brewing, dyeing, forestry, agri-

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